

*Cometary Observations at the Liverpool Observatory, 1896.*     By W. E. Plummer, M.A.

This paper is practically a continuation of that given in the June number of the *Monthly Notices* of last year, and the remarks there made apply equally to the observations here given. The instrument and the micrometers employed, as well as the method of reduction pursued, are precisely the same as those mentioned in the earlier paper. The abbreviations given in the column headed 'No. of Comparisons' are also explained in that place. The comets have mostly been faint objects, and the use of the filar micrometer has generally been impossible. In the case of Swift's Comet of last April the approximate sub-polo position did not permit the instrument to be reversed, so that any error in the orientation of the micrometer has a very injurious effect. On some occasions portions of the object-glass were cut off by the mounting of the instrument.

*Comet 1896 I. (Perrine-Lamp).*

Greenwich Mean Time of Observation.	No. of			Apparent R.A.			Declina- tion.	No of Comparisons (δ)	Apparent Declination of Comet.	Log. Factor of Parallax in (α)	Letter of Refer- ence.
	h	m	s	h	m	s					
1896 Feb. 22	16	22	57.2	25	21	0	57.78	+ 3 18.7	5	+ 27 56 42.6	a
22	16	22	57.2	25	21	0	57.65	+ 2 11.3	5	+ 27 56 43.2	b
23	16	30	16.0	25	21	22	10.50	+ 4 23.9	5	+ 32 34 48.7	c
Mar. 1	7	26	45.4	Ret.	0	18	6.84	+ 8 10.7	Ret.	+ 50 50 35.2	d
1	7	26	45.4	"	0	18	5.31	- 9 12.1	"	+ 50 50 37.0	e
3	9	0	34.6	20	1	5	44.60	+ 10 9.7	5	+ 51 44 54.4	f
4	10	40	10.0	15	1	26	41.36	+ 7 13.8	4	+ 51 44 43.0	g
4	10	40	10.0	15	1	26	41.85	+ 6 29.1	4	+ 51 44 37.7	h
9	9	16	3.7	Ret.	2	35	13.59	+ 4 0.3	Ret.	+ 50 0 48.7	i
9	9	16	3.7	"	2	35	13.67	- 38.0	"	+ 50 0 48.3	j

Greenwich Mean Time of Observation.	*R.A.			No of Comparisons (a)	*Declina- tion.			No. of Comparisons (b)	Apparent Declination of Comet.			Log. Factor of Parallax in (a)		Letter of Refer- ence.	
	h	m	s	Ret.	h	m	s	Ret.	°	'	''	in (a)	in (b)		
1896 Mar. II	9	10	50.2	+2 8.19	2	53	24.72	- 4 49.6	+49	4	42.6	+9.7259	0.6051	k	
	9	10	50.2	+1 39.94	2	53	24.80	- 1 0.1	+49	4	40.9	+9.7259	0.6051	l	
	9	28	42.5	-1 22.62	3	25	34.97	- 1 54.0	+46	53	52.4	+9.7091	0.6376	m	
	10	2	11.3	+1 44.57	3	39	8.15	+ 25.0	+45	46	55.9	+9.7038	0.6966	n	
	8	53	11.4	- 18.06	3	46	24.60	- 3 54.2	+45	8	30.7	+9.6801	0.6035	o	
Comet 1896 III. (Swift).															
Apr. 21	9	1	13.7	+1 51.18	3	32	53.80	+ 9 24.9	Ret.	+30	56	7.2	+9.5886	0.8431	a
	8	53	30.0	-1 31.92	3	30	48.03	+ 3 50.5	5	+33	34	59.8	+9.6023	0.8302	b
	9	10	5.2	+3 12.32	3	28	19.37	+ 5 12.8	5	+36	13	4.9	+9.5986	0.8459	c
	9	14	16.1	+1 10.11	3	25	30.73	- 2 1.9	6	+38	45	39.0	+9.6033	0.8478	d
	9	14	16.1	-1 41.94	3	25	30.69	-11 52.1	6	+38	45	37.6	+9.6033	0.8478	e
	9	26	35.3	+1 21.05	3	10	42.01	+ 3 4.1	5	+47	56	58.5	+9.6166	0.8553	f
	9	26	35.3	+1 4.95	3	10	41.99	+12 8.7	5	+47	56	59.3	+9.6166	0.8553	g
	10	3	52.9	+ 16.44	3	6	1.95	- 3 32.0	Ret.	+50	0	34.4	+9.5497	0.8829	h
	10	3	52.9	- 38.57	3	6	2.17	+ 0 58.8	"	+50	0	32.5	+9.5497	0.8829	i
	10	16	40.0	-3 47.83	2	55	57.82	- 2 33.8	4	+53	40	14.3	+9.5066	0.8909	j
May I	10	16	40.0	-3 54.00	2	55	57.92	- 2 29.4	4	+53	40	11.2	+9.5066	0.8909	k
	11	9	37.1	-1 46.69	2	44	35.29	- 51.5	5	+56	53	42.5	+9.2079	0.9112	l
	11	9	37.1	- 11.91	2	44	35.26	+ 3 54.2	5	+56	53	40.9	+9.2079	0.9112	m
	10	13	30.4	+6 26.26	2	38	50.70	+ 2 37.3	Ret.	+58	15	22.5	+9.5395	0.8792	n

May 1897.

at the *Liverpool Observatory.*

Greenwich Mean Time of Observation.		*—* R.A.		No. of Comparisons (a)		Apparent R.A. of Comet.		Declina- tion.		No. of Comparisons (δ)		Apparent Declination of Comet.		Log. Factor of Parallax in (α)		Letter of Refer- ence.	
		s				h m s						"					
1896 May	4	10	13 30.4	— 1 42.83	Ret.	2 38 51.06		— 8 26.3	Ret.			+ 58 15 25.7		+ 9.5395	0.8792	o	
	5	10	29 59.7	+ 2 58.80	20	2 32 35.70		— 3 28.4	5			+ 59 34 44.0		+ 9.3652	0.8966	p	
	6	9	49 50.5	— 1 15.42	"	2 26 24.38		+ 6 10.7	"			+ 60 45 23.1		+ 9.5149	0.8789	q	
	6	9	49 50.5	— 1 31.87	"	2 26 25.02		— 13.2	"			+ 60 45 25.7		+ 9.5149	0.8789	r	
	7	11	0 11.2	+ 2 33.90	25, Ret.	2 19 32.24		— 4 41.1	5, Ret.			+ 61 55 28.7		+ 8.9375	0.9011	s	
	7	11	0 11.2	— 51.53	"	2 19 31.57		+ 10 23.1	"			+ 61 55 27.2		+ 8.9375	0.9011	t	
	8	10	36 40.3	+ 17.02	Ret.	2 12 56.64		+ 3 32.1	Ret.			+ 62 55 58.0		+ 9.1248	0.8955	u	
	8	10	36 40.3	+ 4 50.34	"	2 12 56.39		+ 10 51.0	"			+ 62 55 57.1		+ 9.1248	0.8955	v	
	9	10	20 32.2	— 4 33.35	"	2 6 10.97		— 4 43.5	"			+ 63 51 55.0		+ 9.1943	0.8904	w	
	9	10	20 32.2	— 6 1.21	"	2 6 10.72		+ 23.0	"			+ 63 51 52.5		+ 9.1943	0.8904	x	
	10	10	44 0.1	— 1 44.39	"	1 59 7.07		+ 12 4.9	"			+ 64 44 40.4		+ 8.6180	0.8916	y	
	10	10	44 0.1	+ 2 16.94	"	1 59 6.13		+ 8 25.1	"			+ 64 44 42.0		+ 8.6180	0.8916	z	
	11	11	3 50.0	+ 5 36.34	"	1 51 58.34		— 6 59.3	"			+ 65 33 6.2		— 8.8789	0.8877	aa	
	12	11	56 29.4	+ 3 15.69	"	1 44 36.87		+ 2 0.5	"			+ 66 18 2.9		— 9.4995	0.8668	bb	
	12	11	56 29.4	— 8.83	"	1 44 37.15		+ 4 44.6	"			+ 66 18 4.5		— 9.4995	0.8668	cc	
	13	11	45 16.3	— 2 46.73	"	1 37 29.41		+ 16 25.1	"			+ 66 57 34.0		— 9.5108	0.8637	dd	
	16	10	40 26.0	+ 3 18.19	"	1 16 6.95		+ 3 43.1	"			+ 68 36 50.2		— 9.3419	0.8677	ee	
	19	11	2 3.1	— 0 21.09	"	0 54 17.60		— 2 47.0	"			+ 69 54 48.3		— 9.6976	0.8360	ff	
	19	11	2 3.1	+ 2 57.48	"	0 54 16.92		— 1 11.0	"			+ 69 54 47.0		— 9.6976	0.8360	gg	
June	2	11	35 50.4	+ 0 15.98	"	23 16 8.89		— 1 12.7	"			+ 72 42 47.1		— 0.0568	0.5591	hh	

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Comet I. 1897 (*Perrine*, 1896 November 2).

Greenwich Mean Time of Observation.	*—* R.A.			Apparent R.A.			Declina- tion.	No. of Comparisons ( $\delta$ )	Apparent Declination of Comet.	Log. Factor of Parallax in ( $\alpha$ )	Letter of Refer- ence.
	h	m	s	h	m	s					
1896 Nov. 5	7 42	30.3	+0 12.42	20 17	9.61	— 9 49.0	Ret.	+23	2 4.6	+9.3254	<i>a</i>
5	7 42	30.3	— 1 35.89	20 17	9.36	+ 7 47.6	"	+23	2 2.5	+9.3254	<i>b</i>
8	6 49	50.0	— 0 16.81	20 12	33.87	+ 3 28.7	"	+20	41 26.2	+9.1968	<i>c</i>
13	7 50	10.2	— 0 40.93	20 6	9.27	+ 7 5.9	5	+16	57 55.8	+9.4260	<i>d</i>
26	6 0	36.4	— 0 7.94	19 55	42.57	+ 6 37.3	4	+ 8	53 27.0	+9.3035	<i>e</i>
26	6 0	36.4	+ 1 31.52	19 55	42.39	— 7 30.4	4	+ 8	53 24.9	+9.3035	<i>f</i>
29	6 26	39.2	+ 0 35.34	19 54	10.58	+ 2 33.6	Ret.	+ 7	16 47.2	+9.3939	<i>g</i>
30	6 22	14.9	— 1 13.21	19 53	43.52	+ 6 20.4	"	+ 6	45 59.7	+9.3939	<i>h</i>
30	6 22	14.9	— 1 8.82	19 53	43.40	— 10 1.7	"	+ 6	46 4.2	+9.3934	<i>i</i>

Notes

February 22.—Comet tolerably bright, but the selection of definite point for observation difficult. February 23.—The comet seemed much fainter, and the separate measures are very discordant. March 1.—Interruptions from clouds. The stars of comparison too far away in declination; the right ascension very uncertain. March 4.—Observation unsatisfactory; an attempt to repeat the observation with the reticule micrometer failed on account of clouds. March 21.—Comet v. ft.; observation doubtful.

April 21.—Comet tolerably bright, especially towards the south-east, which is the point selected for observation. April 28.—Comet well seen, notwithstanding bright moonlight. May 1.—Comet appears much fainter; the sky rather light, though the Moon had not risen. May 7.—Observation very unsatisfactory with either micrometer; the mean of the whole of the measures is given. May 9.—Interrupted by clouds. May 13.—Comet exceedingly faint; further observation probably impossible. May 16.—Brightness much the same as on May 13; comet just visible; no alteration noticeable. June 2.—Some of the measures rejected evidently had no reference to the comet, which could only be seen at intervals by glimpses.

Nov. 5.—Comet very faint and difficult to pick up; separate measures discordant. Nov. 8.—Only three observations possible on account of cloud. Nov. 26.—Comet very faint, but central stellar condensation suspected.